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MINERALOGY.[1]

Minerals from the Chromite Deposits of Lower Silicia.—Traube[2] describes serpentine, albite, chromite, kämmererite and rutile from the chrome deposits of Tampadel in the Zobtengebirge in lower Silicia. The kämmererite is found to some extent in crystals a centimeter across of greenish, reddish, or violet color, and either in hexagonal plates or in combinations of hexagonal pyramid and base. In transmitted light thin cleavage plates show a division of the field into a central uniaxial portion, and six marginal biaxial areas. The marginal areas have an optical angle of 20°–30° with the plane of the axes parallel to the marginal edge. In the same paper cerussite, Iglesiasite, Tarnowitzite, hemimorphite, pyrrhosiderite and sulphur are described from the upper Silician ore region. The cerussite is interesting because of the wealth of the crystals in forms. A crystal from the Friedrichsgrube showed nine forms including the new form $\alpha = 4P$ (441). Another crystal exhibited eighteen forms including the two new forms $f = \infty\breve{P}7$ (170) and $g = 7\breve{P}7$ (171). Iglesiasite, the zinc-bearing cerussite, which has been known from but the one locality of Monti Poni near Iglesias in Sardinia, is found on smithsonite in good crystals at Radzionkau. The forms x (012), i (021), y (102), e (101), i (210), m (110), r (130), p. (111), and o (112), were observed and measured, the form $i = \infty\bar{P}2$ (210) being new to cerussite. Chemical analysis showed the mineral to contain 5.47 per cent. $ZnCO_3$, while that from Iglesias contains 7.02 per cent. Tarnowitzite, the isomorphous mixture of calcium and lead carbonates is studied in the original locality of Tarnowitz. The mineral is sometimes clear and colorless, but is also green, reddish-brown, or yellowish. Lead carbonate is present up to 9 per cent in some specimens. All of the four analyses made from specimens differently colored, showed the presence of a small per cent (up to 0.35) of Sr O. A number of brachydomes were observed which have not before been described upon this mineral, viz: (031), (051), (061) and (071).

Artificial Reproduction of Anhydrite from Evaporation of Salt Solutions.—Brauns[3] has produced anhydrite in microscopic crystals by bringing upon an object glass a large drop of a saturated solution of sodium or potassium chloride or a mixture of the two salts, and placing to one side of this a drop of calcium chloride solution, and on the other side a drop of Epsom salt solution. The three drops are joined to one another by narrow paths and evaporated. During the diffusion of the liquids which takes place, calcium sulphate is formed and appears in crystals of both gypsum and anhydrite along with the crystals of the chlorides. When a little water is added to a group of anhydrite crystals they are dissolved to recrystallize as gypsum. By properly regulating the amount of water added, *Knaüel* of gypsum may be formed with a corroded core of anhydrite. Although anhydrite has been frequently produced artificially, none of the methods heretofore used have simulated its production in nature from the evaporation of sea water.

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[1] Edited by Dr. Wm. H. Hobbs, University of Wisconsin, Madison, Wis.

[2] Zeitschrift d. deutsch. geologischen Gesellschaft, xlvi, pp. 50–67, 1894.

[3] Neues Jahrbuch, f. Min., etc., 1894, (II), pp. 257–264.

Artificial Crystals of Zinc Oxide.—Ries[4] has examined artificial crystals of zinc oxide from the New Jersey Zinc Works and found them to possess the combinations (110), (225); (110), (112); and (110), (124): the form (124) being new. The crystals examined were colorless, transparent, holohedral, and devoid of basal cleavage.

Artificial Copper Crystals in Aventurine Glass.—Washington[5] has made a microscopical study of the aventurine glass from the famous Murano near Venice. The spangles of copper appear in large and small phenocrysts and in microlites. The large phenocrysts are .05–.12 mm. in diameter, of tabular habit, and not over .002 mm. thick They are generally hexagonal in outline, but some are equilateral triangles with the angles somewhat truncated. Distinct skeleton forms appear among the commoner individuals with plane faces. These crystals are all doubtless octahedra flattened parallel to an octahedral face, a habit which Dana has shown to be common in the case of copper crystals. Some individuals exhibited the distorted combination of cube and octahedron, while others were cyclic twins parallel to an octahedral face and either vierlings or fünflings, the latter producing a closed form.

New Minerals, *Neptunite and Epididymite.*—Flink[6] describes in detail two new minerals associated with ægerine from Greenland. The exact locality is not certainly known, but it is thought to be near

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[4] Am. Jour. Sci., xlviii, p. 256, Sept., 1894.

[5] Am. Jour. Sci., xlviii, pp. 411–418, Nov., 1894.

[6] Zeitsch. f. Kryst., xxiii, pp. 344–367, 1894.

Narsisik. *Neptunite* is a black titano-silicate of iron, manganese, soda, and potash, which is found on the surface and in fissures in ægerine crystals, in crystals varying from microscopic dimensions to five centimeters. These crystals, which are monoclinic, exhibit the following forms : (100), (010), (001), (110), $(\bar{3}01)$, $(\bar{2}01)$, (111), (221), $(\bar{5}12)$ and $(\bar{1}11)$; the forms (001), (110), and the pyramid $(\bar{5}12)$ predominating. The axial ratio is a : b : c : = 1.31639 : 1 ; 0.8075 and $\beta = 64° 22'$. Twinning is very rare with the base the twinning plane. Cleavage is distinct parallel to the prism, the cracks meeting at 80° in sections normal to ć. The specific gravity is 3.234 and the hardness 5–6. The plane of the optical axes is normal to the plane of symmetry and the acute bisectrix makes 18° with the vertical axis in the obtuse angle β. The absorption is $\mathfrak{c}$ deep red brown, $\mathfrak{b}$ yellow red, and $\mathfrak{a}$ bright red, with $\mathfrak{c} > \mathfrak{b} > \mathfrak{a}$. Written empirically the formula of the mineral is $(\frac{2}{3}Fe + \frac{1}{3}Mn)(\frac{3}{4}Na^2 + \frac{1}{4}K_2)Si_4\,Ti\,O_{12}$. The interfacial angles never vary more than 10° from the corresponding angles of titanite, which leads Flink to think that neptunite and titanite are isomorphous.

Epididymite is dimorphous with the eudidymite of Brögger, the empirical formula of both minerals being $H\,Na\,Be\,Si_3O_8$. Epididymite is orthorhombic in symmetry, whereas eudidymite is monoclinic. The axial ratio of epididymite is a : b : c = 1.7367 : 1 : 0.9274. The forms observed were (100), (010), (001), (110), (310), (210), (201), (403), (401), (101), (304), (203), and (221). The crystals are columnar parallel to $\breve{b}$, and the cleavage is perfect parallel to the base and less perfect parallel to the macro-pinacoid. H=6. G=2.548. The mineral is colorless. The plane of the optical axes is the base with a coincident with $\mathfrak{a}$ the acute bisectrix. The optical angle calculated from measurements of the indices of refraction is $2V_a = 31° 4'$. The relation between epididymite and eudidymite would seem to be somewhat similar to that existing between the monoclinic and triclinic feldspars of the same composition.

Other minerals described from the locality are Xatapleite (heretofore found only at Langesund), ægerine, Arfedsonite, quartz, orthoclase, albite, eudialite, zircon, epidote, Zinnwaldite, microlite, and elpidite.

Crossite. Palache[7] has examined the "glaucophane" of some rocks from the Coast Ranges and finds it to differ so much from the known occurrences of glaucophane, that he proposes to call it crossite. The occurrence specially studied is in a boulder from the west slope of the Contra Costa Hills near Berkeley, Cal. Crystals of the mineral show the prism and clinal pinacoid, the prism angle being 126° 6′. The axis of greatest elasticity $\mathfrak{a}$ makes an angle of 11°–13° with ć, probably in the obtuse angle. The pleochroism is very strong with $\mathfrak{a}$ sky blue to dark blue, $\mathfrak{b}$ reddish to purplish violet, and $\mathfrak{c}$ yellowish-brown to greenish-yellow. The absorption formula is $\mathfrak{a} \overset{=}{>} \mathfrak{b} > \mathfrak{c}$. The strea is pale blue. G=3.126–3.16. Below are quoted the analyses of glaucophane (I), Riebeckite (II), and the Berkeley amphibole (III) for comparison:

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[7] Bull. Dept. Geol. Univ. of California, i; pp. 181–191, pl. 11, 1894.

	SiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Total
I.	55.64	15.11	3.08	6.85	.56	7.80	2.40	9.34	——	100.78
II.	50.01	——	28.30	9.87	.63	.34	1.32	8.79	.72	99.98
III.	55.02	4.75	10.91	9.45	trace	9.30	2.38	7.62	.27	99.70

Optically the mineral is almost identical with the amphibole described by Cross from Custer Co., Colorado, and it is closely related to Riebeckite. Chemically it is intermediate between Riebeckite and glaucophane.

Willyamite. Pittman[8] gives the name Willyamite to a sulphantimonide of cobalt and nickel from the Broken Hill mining district of New South Wales, having the formula (NiCo) S (Co Ni) Sb, cobalt and nickel bėing present in nearly equal amounts.

Kylindrite. Frenzel[9] describes a new mineral from Mina Santa Cruz at Poopó, Bolivia, which is notable as well for its unusual chemical composition as for its crystal form. Analysis furnished the following results:

Pb	Ag	Fe	Sb	Sn	S	Total
35.41	0.62	3.00	8.73	26.37	24.50	98.63

which correspond to the formula $Pb_6Sb_2Sn_2S_2$ or $6PbS, Sb_2S_3\ 6SnS_2$, the silver and iron replacing the lead. The mineral receives its name from the remarkable cylindrical rods in which it appears. On grinding these in the mortar they separate into concentric cylindrical shells. A few minute needles which were found in a cavity show the symmetry of the mineral to be orthorhombic. The lustre is metallic, the color dark leaden, and the streak black. H=2.5 and G=5.42. The mineral is soluble in hot hydrochloric and nitric acids, and melts in the closed tube with the separation of sulphur.

Wm. H. Hobbs.

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[8] Rec. Geol. Surv., New South Wales, iv, pt. i; pp. 21–22, 1894.

[9] Neues Jahrbuch f. Mineralogie, etc., 1893, II, pp. 125–128.